



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/561,064

12/16/2005

Haixiao Sun

42P21717

4017

45209

7590

02/25/2009

INTEL/BSTZ

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

1279 OAKMEAD PARKWAY

SUNNYVALE, CA 94085-4040

EXAMINER

SEMENENKO, YURIY

ART UNIT

PAPER NUMBER

2841

MAIL DATE

DELIVERY MODE

02/25/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<i>Office Action Summary</i>	Application No.	Applicant(s)	
	10/561,064	SUN, HAIXIAO	
	Examiner	Art Unit	
	YURIY SEMENENKO	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2009.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 19-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 19-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse Groups I (claims 1-10 and 19-30), drawn to a system and microelectronic assembly, in the reply filed on 01/07/2009 is acknowledged. Claims 11 - 18 have been cancelled. Claims 1-10 and 19-30 are now pending in the application.

Specification

2. The disclosure is objected to because of the following informalities:
page 2, line 4: before DSC applicant is required to state the full term.
page 3, line 12: there is not fig. 8 in the drawings.
page 5, line 24: before ENIG applicant is required to state the full term.
Appropriate correction is required.

Claim Objections

3. Claims 1-10 is objected to because of the following informalities:
claim 1, line 4: "solidified solder" should be changed to – a solidified solder - for proper antecedence basis.
The use of "adapted to" in line 7 of claim 1 and in lines 2 of claim 9 makes what follows a functional statement and not a positive limitation because it has been held that the recitation that an element is - adapted to - to perform a function only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.
Claims 2-10 directly or indirectly depend upon claim 1 and inherit the same deficiency.
Claim 3: before ENIG applicant is required to state the full term.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4.1. Claims 1, 3-10, 19 and 21-27 are rejected under 35U.S.C. 103(a) as being unpatentable over Fukano (US 5986348) hereinafter Fukano in view of Chan et al. (US 4983804) hereinafter Chan.

Regarding claim 1: Fukano discloses in Fig. 4 a microelectronic assembly comprising: a substrate 14 having bonding pads 12a and 12b disposed on a mounting surface thereof, the bonding pads including a ferromagnetic material 22 thereon (col. 2:26-27); solidified solder 30 disposed on the bonding pads; a surface mount component 34 bonded to the substrate 14 by way of the solidified solder 30 and including a magnetic layer 32 disposed on a substrate thereof (col. 2:48-53), the magnetic layer being adapted to cooperate with the ferromagnetic material in the bonding pads to establish a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering (col. 2:45-53). The magnetic layer 32 is removed after magnetized. So Fukano doesn't explicitly teach that a surface mount component including a magnetic layer disposed on a substrate side thereof.

Chan teaches in fig. 4 a microelectronic assembly comprising: a substrate 10 having bonding pads 34, 35 disposed on a mounting surface thereof, mount component

Art Unit: 2841

40 (co. 4:10-13) bonded to the substrate including a magnetic layer 21, fig. 1 disposed on a substrate side thereof (col. 5:4-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention a surface mount component including a magnetic layer disposed on a substrate side thereof, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

Regarding claim 19: Fukano discloses in Fig. 4 a surface mount component 34 adapted to be bonded to a bonding pads 12a and 12b of a substrate 14 by way of solidified solder 30, the surface mount component 34 including a magnetic layer 32 disposed on a substrate side thereof (col. 2:48-63), the magnetic layer being adapted to cooperate with a ferromagnetic material in the bonding pads to establish a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during, (col. 2:45-53). The magnetic layer 32 is removed after magnetized. So Fukano doesn't explicitly teach that a surface mount component including a magnetic layer disposed on a substrate side thereof.

Chan teaches in fig. 4 a microelectronic assembly comprising: a substrate 10 having bonding pads 34, 35 disposed on a mounting surface thereof, mount component 40 (co. 4:10-13) bonded to the substrate including a magnetic layer 21, fig. 1 disposed on a substrate side thereof (col. 5:4-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention a surface mount component including a magnetic layer disposed on a substrate side thereof, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

Regarding claims 3, 6 and 23: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to

Art Unit: 2841

claim 1(19), wherein the bonding pads 12a and 12b on the substrate 14 comprise ENIG pads (col. 2:11-45),

except Fukano doesn't explicitly teach the ferromagnetic material in the bonding pads comprise nickel; wherein the magnetic layer comprises a magnetic material including at least one of nickel and a ferronickel alloy.

Chan teaches the ferromagnetic material in the bonding pads 43, 44, fig. 4 (col. 5:4-9) comprise nickel (col 3:7-11); wherein the magnetic layer comprises (col. 2:52-61) a magnetic material including at least one of nickel and a ferronickel alloy (col. 5:4-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention wherein the ferromagnetic material in the bonding pads comprise nickel; and wherein the magnetic layer comprises a magnetic material including at least one of nickel and a ferronickel alloy, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

Regarding claims 4-5 and 21-22: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to claim 1(19), wherein soldering comprises a reflow process, and wherein the magnetic layer comprises a magnetic material. Fukano teaches the content of the ferromagnetic material can be adjusted to obtain the desired amount of magnetism,

except Fukano doesn't explicitly teach a magnetic material having a Curie temperature that is above a peak reflow temperature range of the solder; and wherein the magnetic layer comprises a magnetic material having a remanence adapted to have a minimum impact on a performance of circuits within the SMT component or within the substrate.

Chan teaches in fig. 3 how to choose content of the alloy of the ferromagnetic material to have needed the Curie temperature and having a remanence adapted to have a minimum impact on a performance.

Therefore it would have been obvious to one of ordinary skill in the art, at the

Art Unit: 2841

time the invention was made for Fukano to include in his invention a magnetic material having a Curie temperature that is above a peak reflow temperature range of the solder; and wherein the magnetic layer comprises a magnetic material having a remanence adapted to have a minimum impact on a performance of circuits within the SMT component or within the substrate, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

Regarding claims 7 and 24: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to claim 1(19). Fukano teaches the content and thickness of the ferromagnetic material can be adjusted to obtain the desired amount of magnetism. Although Fukano doesn't explicitly teach the magnetic layer has a thickness between about 1 micron and about 5 microns.

Chan teaches the magnetic layer 19, fig. 1 has a thickness between about 200 micron (col. 3:37-39).

Further the courts have held that change in size of configuration, without any criticality, is within the level of skill in the art as particular size claimed by applicant is nothing more than one of numerous shape or size that a person of ordinary skill in the art would have found obvious to provide using routine experimentation based on its suitability for the intended use of the invention, See *In re Dailey*, 149 USPQ 47 (CCPA 1966).

Furthermore "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to change the thickness of the magnetic layer disclosed by Fukano to has a thickness between about 1 micron and about 5 microns in order to obtain the desired amount of magnetism and since the courts have held that change in shape or change in size configuration, without any criticality, is within the level of skill in the art as particular shape or size claimed by applicant is nothing more than one of

Art Unit: 2841

numerous shape or size that a person of ordinary skill in the art would have found obvious to provide using routine experimentation based on its suitability for the intended use of the invention, See *In re Dailey*, 149 USPQ 47 (CCPA 1966).

Regarding claims 8 and 25: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to claim 1(19),

except Fukano doesn't explicitly teach the magnetic layer is one of a continuous layer and a discontinuous layer.

Chan teaches in fig. 1 the magnetic layer 21 is one of a continuous layer and a discontinuous layer (col. 2:52-61).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention the magnetic layer is one of a continuous layer and a discontinuous layer, as taught by Chan in order to reduce production's cost.

Regarding claims 9-10 and 26-27: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to claim 8,

except Fukano doesn't explicitly teach the magnetic layer comprises sublayers defining a pattern adapted to minimize impact on circuits of the surface mount component from a magnetic field of the magnetic layer; and the magnetic layer comprises sublayers defining a pattern corresponding to a pattern of the bonding pads on the substrate.

Chan teaches in fig. 1 the magnetic layer 21 comprises sublayers defining a pattern (col. 2:26-36) adapted to minimize impact on circuits of the surface mount component from a magnetic field of the magnetic layer; and the magnetic layer comprises sublayers defining a pattern (col. 5: 9-11) corresponding to a pattern of the bonding pads on the substrate. Further the courts have held that change in shape of configuration, without any criticality, is within the level of skill in the art as particular

Art Unit: 2841

shape claimed by applicant is nothing more than one of numerous shape that a person of ordinary skill in the art would have found obvious to provide using routine experimentation based on its suitability for the intended use of the invention, See *In re Dailey*, 149 USPQ 47 (CCPA 1966).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention the magnetic layer comprises sublayers defining a pattern adapted to minimize impact on circuits of the surface mount component from a magnetic field of the magnetic layer; and the magnetic layer comprises sublayers defining a pattern corresponding to a pattern of the bonding pads on the substrate, as taught by Chan in order to reduce production's cost and since the courts have held that change in shape or change in size configuration, without any criticality, is within the level of skill in the art as particular shape or size claimed by applicant is nothing more than one of numerous shape or size that a person of ordinary skill in the art would have found obvious to provide using routine experimentation based on its suitability for the intended use of the invention, See *In re Dailey*, 149 USPQ 47 (CCPA 1966).

4.2. Claims 2 and 20 are rejected under 35U.S.C. 103(a) as being unpatentable over Fukano in view of Chan as applied to claims 1, 3-10, 19 and 21-27 and further in view of Admitted by Applicant Prior Art (Background of Invention section), hereinafter AAPA.

Regarding claims 2 and 20: Fukano as modified by the teaching of Chan, discloses the assembly having all of the claimed features as discussed above with respect to claim 1(19),

except, Fukano doesn't explicitly teach the surface mount component is a capacitor.

AAPA teaches in fig. 1a, b the surface mount component is a capacitor 16, (page 2, [0004]).

Therefore it would have been obvious to one of ordinary skill in the art, at the

Art Unit: 2841

time the invention was made for Fukano to include in his invention the surface mount component is a capacitor, as taught by AAPA in order to reduce production's cost.

4.3. Claims 28 and 30 are rejected under 35U.S.C. 103(a) as being unpatentable over Fukano in view of Chan as applied to claims 1, 3-10, 19 and 21-25 and further in view of Dalal et al., (US 6618267) hereinafter Dalal.

Regarding claim 28: Fukano discloses in Fig. 4 a system comprising: a microelectronic assembly including: a substrate 14 having bonding pads 12a and 12b disposed on a mounting surface thereof, the bonding pads including a ferromagnetic material 22 therein (col. 2:26-27); solidified solder 30 disposed on the bonding pads; a surface mount component 34 bonded to the substrate 14 by way of the solidified solder 30 and including a magnetic layer 32 disposed on a substrate side thereof (col. 2:48-53), the magnetic layer being adapted to cooperate with a ferromagnetic material in the bonding pads to establish a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering (col. 2:45-53). The magnetic layer 32 is removed after magnetized. So Fukano doesn't explicitly teach that a surface mount component including a magnetic layer disposed on a substrate side thereof.

Chan teaches in fig. 4 a microelectronic assembly comprising: a substrate 10 having bonding pads 34, 35 disposed on a mounting surface thereof, mount component 40 (co. 4:10-13) bonded to the substrate including a magnetic layer 21, fig. 1 disposed on a substrate side thereof (col. 5:4-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention a surface mount component including a magnetic layer disposed on a substrate side thereof, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

Fukano fail also to explicitly teach a main memory coupled to the microelectronic assembly.

Dalal teaches in fig. 1a, b, c, a main memory 116 and 118 coupled to the microelectronic assembly 110.

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention the a main memory coupled to the microelectronic assembly, as taught by Dalal in order to create microelectronic device.

Regarding claim 30: Fukano as modified by the teaching of Chan and Dalal, discloses the assembly having all of the claimed features as discussed above with respect to claim 28, wherein the bonding pads 12a and 12b on the substrate 14 comprise ENIG pads (col. 2:11-45),

except Fukano doesn't explicitly teach the ferromagnetic material in the bonding pads comprise nickel;

Chan teaches the ferromagnetic material in the bonding pads 43, 44, fig. 4 (col. 5:4-9) comprise nickel (col 3:7-11); wherein the magnetic layer comprises (col. 2:52-61) a magnetic material including at least one of nickel and a ferronickel alloy (col. 5:4-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention wherein the ferromagnetic material in the bonding pads comprise nickel, as taught by Chan in order to provide a magnetic force of a sufficient magnitude to hold the surface mount component on the substrate before and during soldering.

4.4. Claim 29 is rejected under 35U.S.C. 103(a) as being unpatentable over Fukano in view of Chan and in view of Dalal as applied to claims 1, 3-10, 19 and 21-27 and further in view of Admitted by Applicant Prior Art (Background of Invention section), hereinafter AAPA.

Regarding claim 29: Fukano as modified by the teaching of Chan and Dalal, discloses the assembly having all of the claimed features as discussed above with respect to

Art Unit: 2841

Claim 29,

except Fukano doesn't explicitly teach the surface mount component is a capacitor.

AAPA teaches in fig. 1a, b the surface mount component is a capacitor 16, (page 2, [0004]).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made for Fukano to include in his invention the surface mount component is a capacitor, as taught by AAPA in order to reduce production's cost.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Khandekar et al. – US 7482199;

Wood et al. – US 6364196;

Coenen – US 7429797.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean A. Reichard can be reached on (571)- 272-2800 ext. 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2841

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. S./

Examiner, Art Unit 2841

/Dean A. Reichard/

Supervisory Patent Examiner, Art
Unit 2841